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09/665,372	09/20/2000	Vincent Liu	GIC-619	6040

7590 08/11/2004	EXAMINER

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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *28-33* is/are allowed.

6)☒ Claim(s) *1-12,14-18,20-22 and 27* is/are rejected.

7)☒ Claim(s) *13,19 and 23-26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 September 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 1-4 and 27 have been considered

but are moot in view of the new ground(s) of rejection.

Claim Objections

2.   Claim 19 is objected to because of the following informalities: The examiner

understood "fir" to be "for". Appropriate correction is required.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-4 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Peterson et al. (5986712), (hereinafter referred to as "Peterson") in view of Vetro et

al. (6490320), (hereinafter referred to as "Vetro").

Regarding claims 1-2 and 27, Peterson discloses an apparatus that

controls the bit rate for partitions or stripes of video pictures (Peterson: column

1, lines 7-10). This apparatus comprises "maintaining a budget of a number of

processing cycles that are available at a processor to process the data"

(Peterson: figure 3, column 3, lines 40-42, wherein the budget is the target

number of bits, the processing cycles is a function of the bits, i.e., the higher the

number of bits, the more processing cycles that are required, the processor is the

stripe encoder), "maintaining an estimate of the number of processing cycles required by the processor to process the video data" (Peterson: column 4, lines 1-7, wherein the estimate is the actual number), "providing the video data to the processor" (Peterson: figure 2, wherein the global rate controller supplies the video, the processor is the encoder), "wherein the processor operates in a plurality of modes and selects one of the modes for processing each frame according to a relationship between the number of budgeted cycles and the estimated number of cycles" (Peterson: column 5, lines 24-67, column 6, lines 1-9, wherein the mode is the process of allocating extra bits to encoders that need them and taking extra bits away from encoders that don't need them. This is done by calculating differences between the target, or budgeted, and estimated, or actual, number of bits as illustrated in columns 5-10 for each frame where the frames are the I, P, and B frames). However, this apparatus lacks the processor being a transcoding processor which operates in a plurality of transcoding modes. Vetro teaches that when video content has already been encoded, it is sometimes necessary to further convert the bitstream before the stream is transmitted (Vetro: column 2, lines 6-12). Vetro then discloses that this conversion is done using a transcoder (Vetro: column 2, lines 13-15). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to take the apparatus disclosed by Peterson and add the transcoder processor taught by Vetro in order to obtain an apparatus that is more versatile by being able to convert an already encoded stream.

Regarding claim 3, Peterson discloses "the estimated number of required cycles is updated after each frame is processed" (Peterson: figure 3, column 6, lines 23-32, wherein the estimated number is the actual number, which is computed after processing).

Regarding claim 4, Peterson discloses "the number of budgeted cycles is updated after each frame is processed" (Peterson: figure 3, item 301, wherein the budgeted cycles is the target, which is computed or updated for each new picture).

1.   Claims 5-10 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson et al. (5986712), (hereinafter referred to as "Peterson") in view of Vetro et al. (6490320), (hereinafter referred to as "Vetro") in further view of Tabatabai et al. (5686964), (hereinafter referred to as "Tabatabai").

Regarding claims 5 and 14-17, Peterson in view of Vetro differs from claims 5 and 14-17 in that claims 5 and 14-17 further require requantization, full transcoding, and bypass modes as claimed. Tabatabai teaches that selecting between modes is well known in the art as indicated by the prior art label of figure 3 (Tabatabai: figure 3, wherein the bypass mode is the top most switch position which bypasses motion compensation and requantization, the full transcoding mode is the bottom switch position which performs motion compensation, and the requantization mode is the middle switch position which performs requantization but no motion compensation. By selecting a mode for an I or P frame, all subsequent I and P frames would have the same mode

applied to them as the original I or P frame). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to take the apparatus disclosed by Peterson, add the transcoder processor taught by Vetro, and add the mode selection taught by Tabatabai in order to obtain an apparatus that more efficiently codes a frame by being able to select the mode desired.

Regarding claim 6, Peterson discloses "the number of budgeted cycles and the estimated number of cycles are provided for remaining frames of a GOP" (Peterson: column 11, lines 21-54, wherein the estimate is the actual, and the budgeted is the target or nominal).

Regarding claim 7, Peterson discloses "the estimated number of cycles associated with a current video frame is responsive to an actual number of cycles consumed for at least one previous frame" (Peterson: column 9, lines 10-24, wherein S_t is the actual number for the previous frame).

Regarding claim 8, Peterson discloses "storing the frames in a buffer associated with the respective processor prior to processing the frames" (Peterson: column 5, lines 36-37, wherein the buffer is the VBV buffer). Although not disclosed, the buffer could comprise a "smoothing buffer" (Official Notice). Doing so would have been obvious since smoothing buffers provide a constant bit rate output.

Regarding claim 9, Peterson discloses "the processor is in a multi-processor device" (Peterson: figure 2, wherein the processors are the encoders).

Regarding claim 10, Tabatabai discloses "the different modes have different computational intensities" (Tabatabai: figure 3, wherein the modes which utilize motion compensation would have a greater computational intensity than the modes which do not perform motion compensation).

2.   Claims 11-12, 18, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson et al. (5986712), (hereinafter referred to as "Peterson") in view of Vetro et al. (6490320), (hereinafter referred to as "Vetro"), in further view of Ozkan (5838686).

Regarding claim 11, as applied to claim 1, although Peterson in view of Vetro does show a plurality of channels, these channels are different from the channels as claimed (Peterson: figure 2, wherein the channels are the paths connecting the GRC to the encoders). Ozkan teaches that in order to maximize efficiency and utilization of a link, it is desirable to share the link among multiple video channels (Ozkan: column 1, lines 17-21). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to take the apparatus disclosed by Peterson, add the transcoder processor taught by Vetro, and add the plurality of channels taught by Ozkan in order to obtain an apparatus that efficiently transfers data between two points.

Regarding claims 12 and 18, Peterson discloses "for each channel, determining if there is a cycle deficit associated with a current frame based on a carried over cycle deficit, if any, from a previous frame, and a difference between: an actual number of cycles used for the previous frame and the

number of budgeted cycles for the current frame of the channel" (Peterson: column 5, lines 53-67 – column 6, lines 1-22, wherein the cycle deficit is indicated by the difference yielding a negative result).

Regarding claim 20, Peterson discloses "the processing cycle deficit is used in determining the estimated number of cycles" (Peterson: column 6, lines 1-16, wherein the estimated number is the actual number, the cycle deficit determines the bit allocation between the encoders which then yields the actual or estimated number of cycles used).

Regarding claim 21, Peterson discloses "the cycle deficit is associated with the remaining frames of a GOP of video" (Peterson: column 8, lines 22-67, wherein the association is calculating the number of remaining frames and then processing them using the cycle deficit).

Regarding claim 22, Peterson discloses "the selected mode for the current frame is based on whether cycle deficit exceeds a predetermined level" (Peterson: column 5, lines 24-67, column 6, lines 1-9, wherein the mode is the process of allocating extra bits to encoders that need them and taking extra bits away from encoders that don't need them. This is done by calculating differences between the target, or budgeted, and estimated, or actual, number of bits as illustrated in columns 5-10, wherein the predetermined level is 0. Once a deficit is detected, (greater or less than 0), bits are automatically allocated).

Allowable Subject Matter

3.   Claims 13, 19, and 23-26 are objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

4.   Claims 28-33 are allowed.

Conclusion

5.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

6.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure:

        US-6167084   12-2000   Wang et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Czekaj whose telephone number is (703) 305-3418. The examiner can normally be reached on Monday - Friday 9 hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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